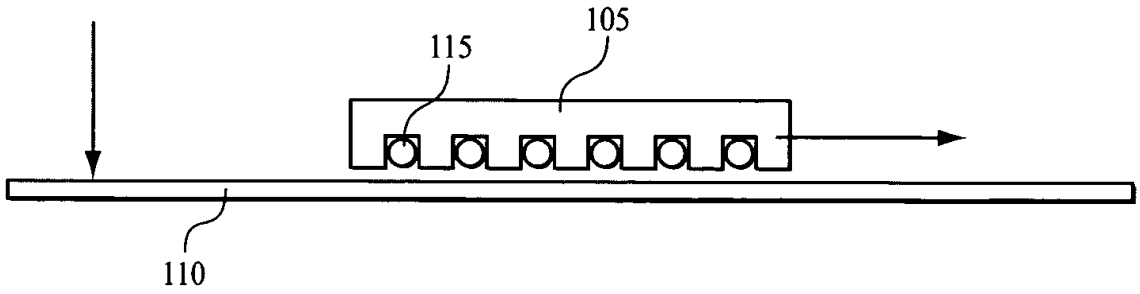

FIG. 1A

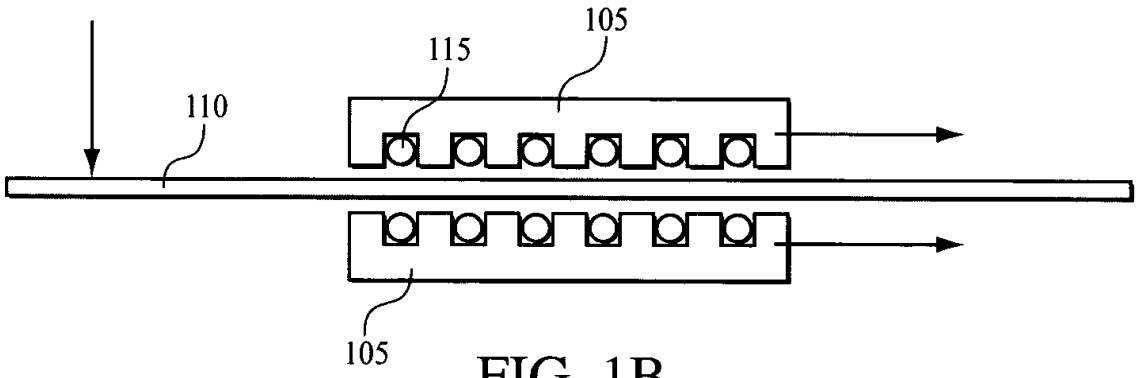

FIG. 1B

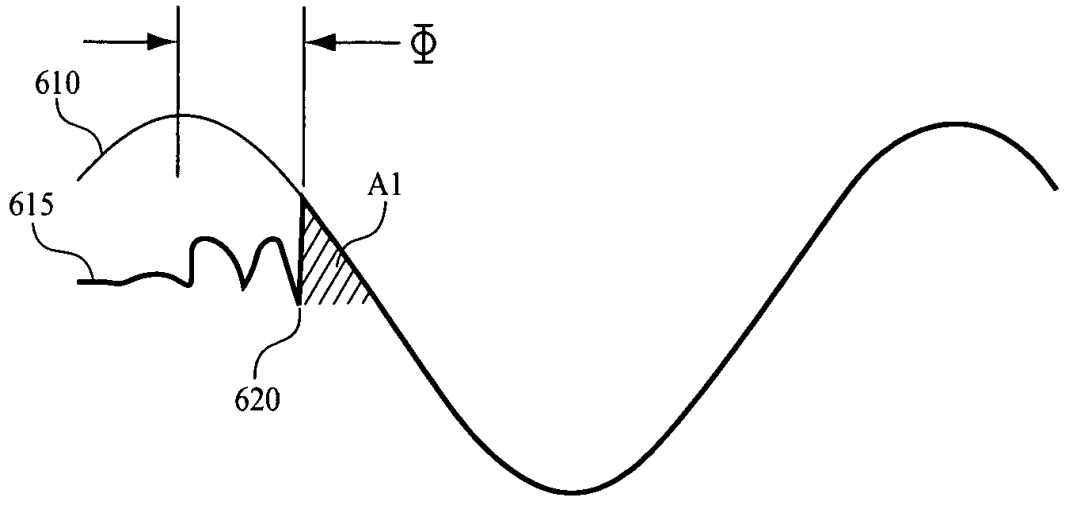

FIG. 6

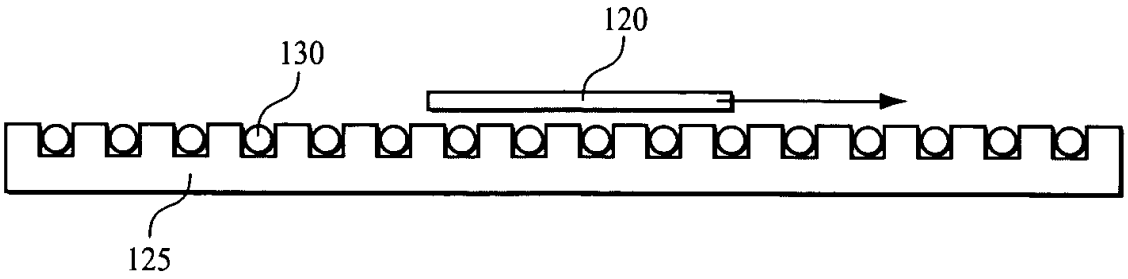

FIG. 2A

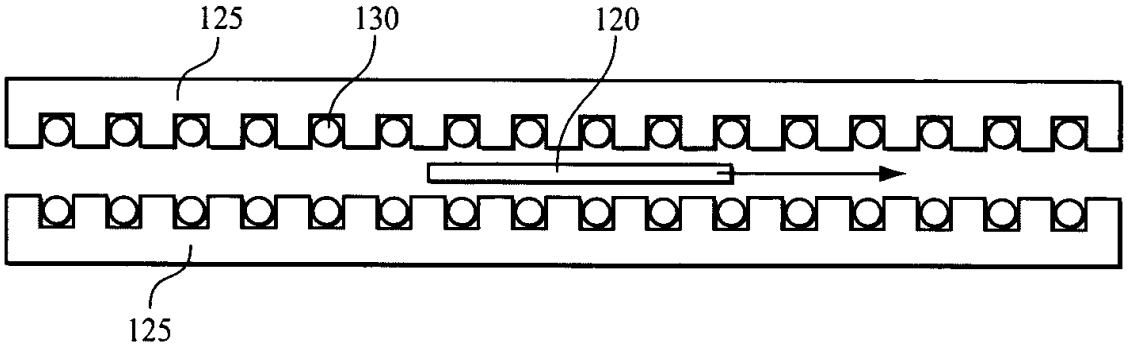

FIG. 2B

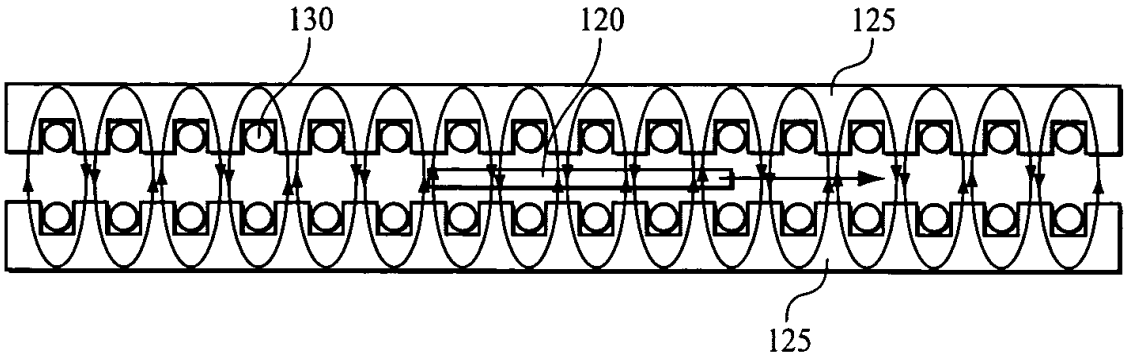

FIG. 3

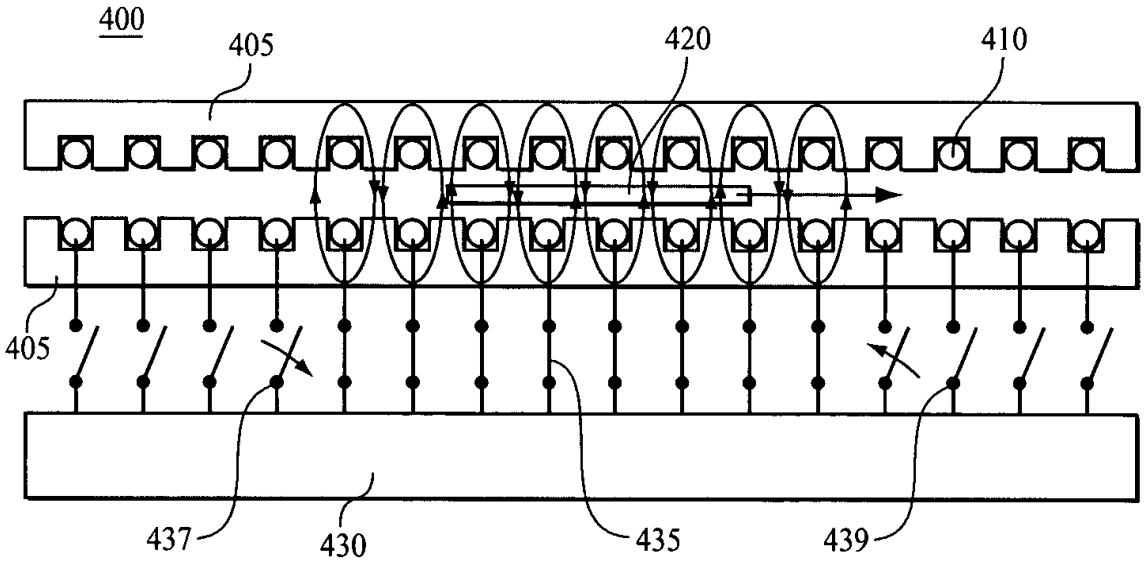

FIG. 4

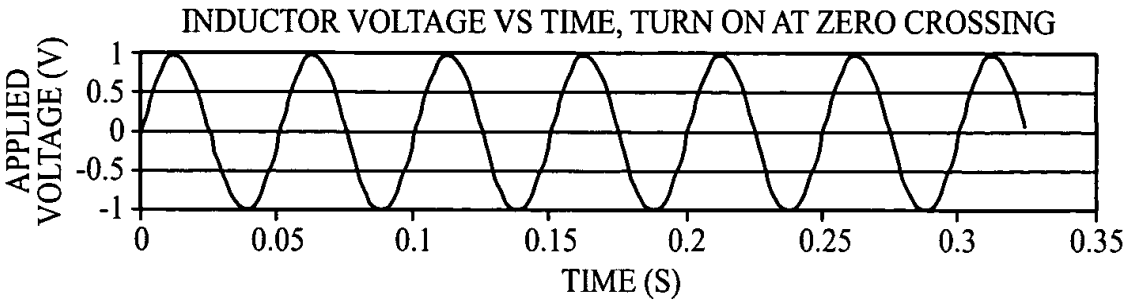

FIG. 5A

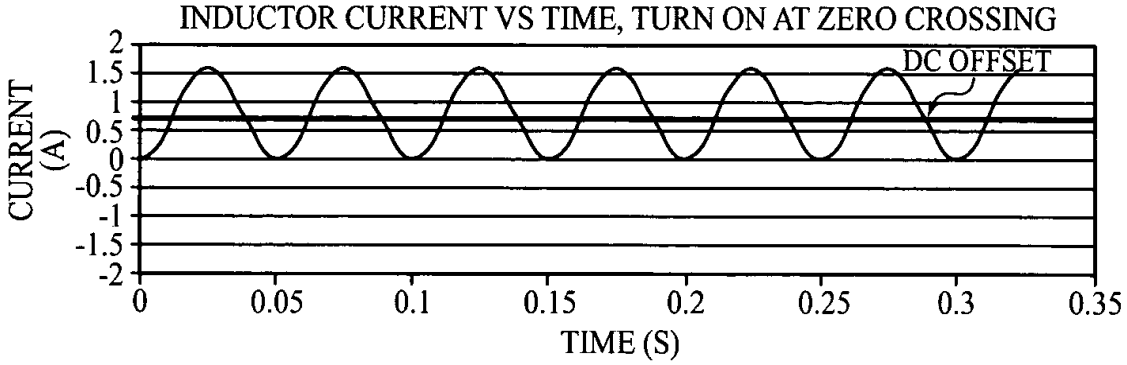

FIG. 5B

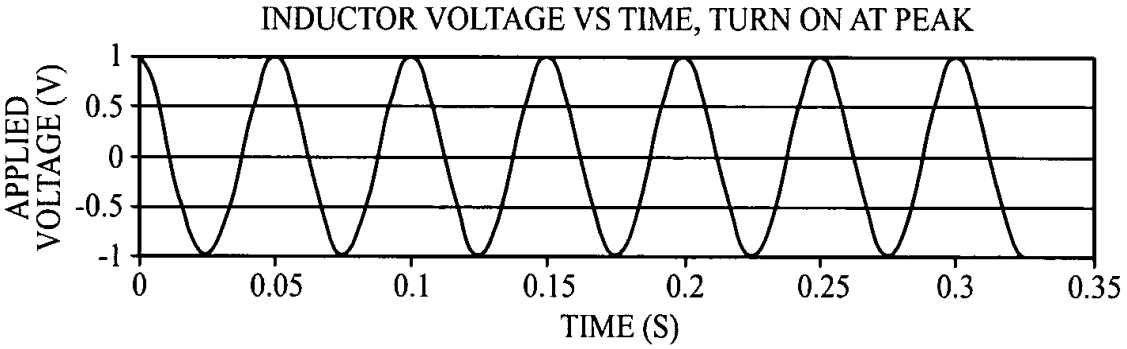

FIG. 5C

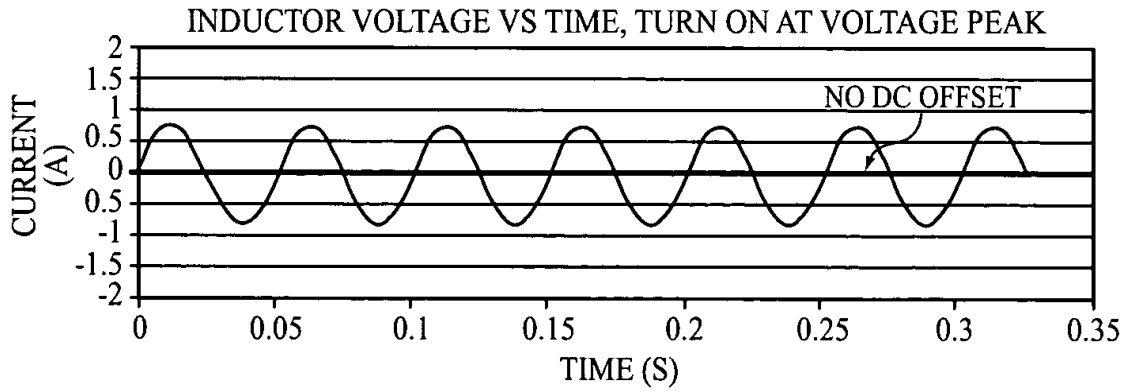

FIG. 5D

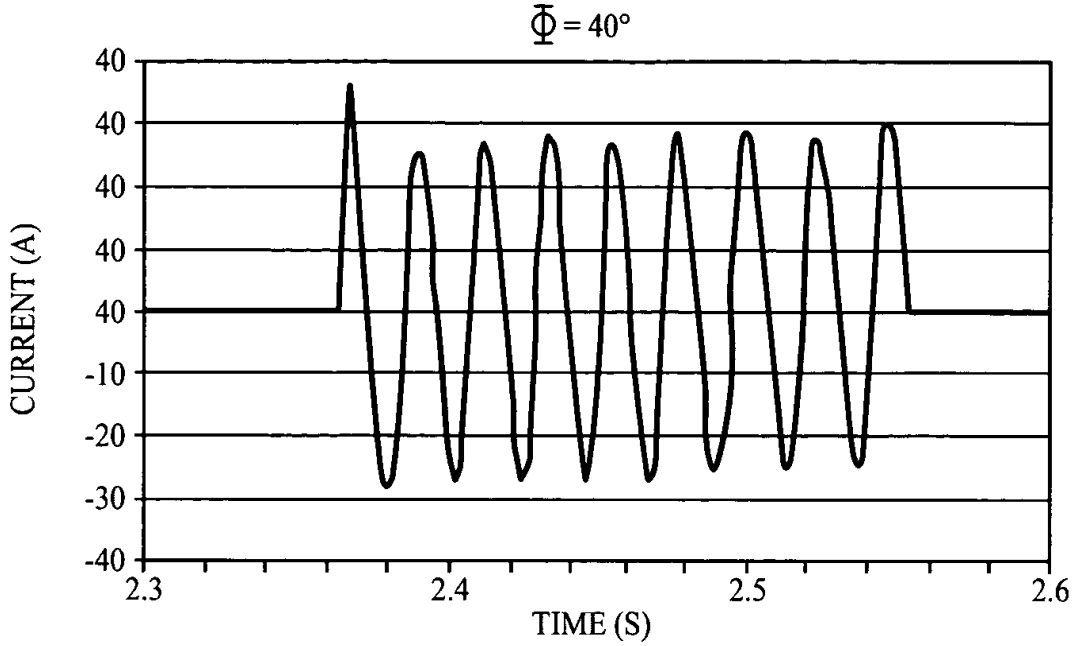
Φ = 40°
40
40
40
40
-10
-20
-30
-40
CURRENT (A)
2.3
2.4
2.5
2.6
TIME (S)

FIG. 7A

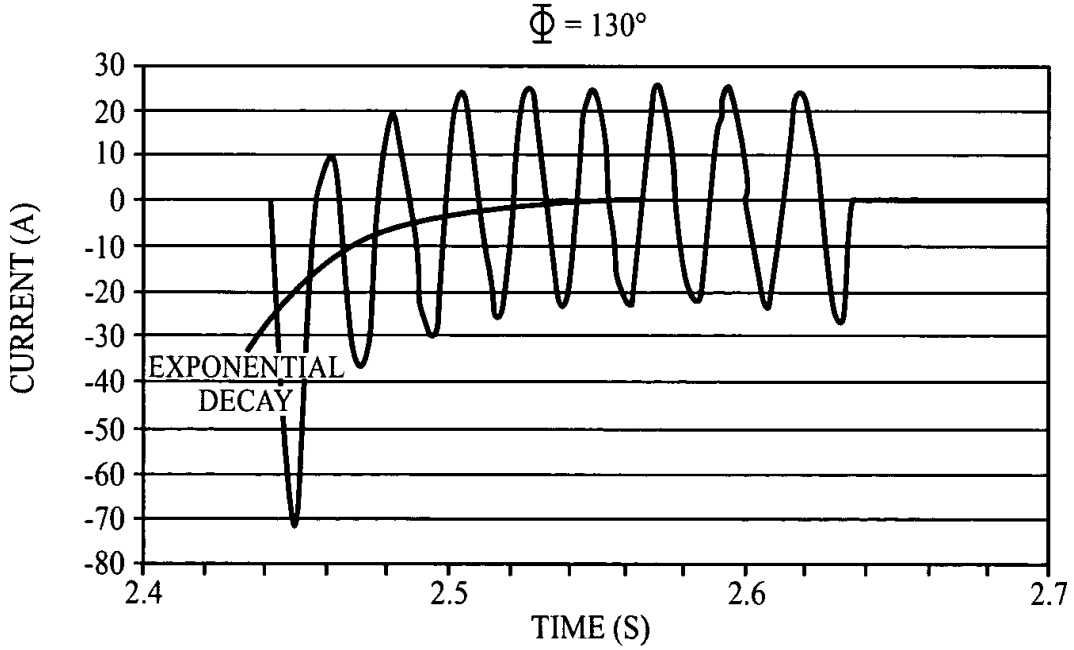
Φ = 130°
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
CURRENT (A)
EXPONENTIAL
DECAY
2.4
2.5
2.6
2.7
TIME (S)

FIG. 7B

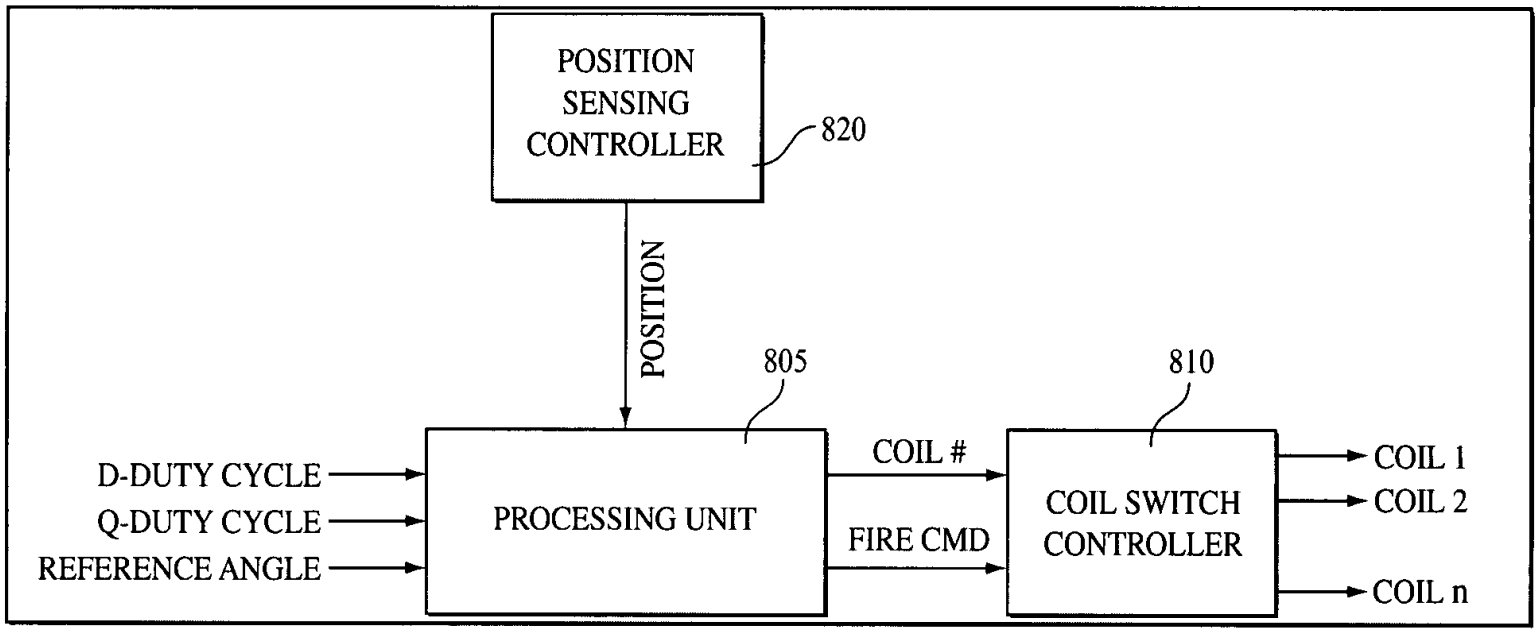
POSITION SENSING CONTROLLER
820
POSITION
805
810
D-DUTY CYCLE
Q-DUTY CYCLE
REFERENCE ANGLE
PROCESSING UNIT
COIL #
FIRE CMD
COIL SWITCH CONTROLLER
COIL 1
COIL 2
COIL n

FIG. 8

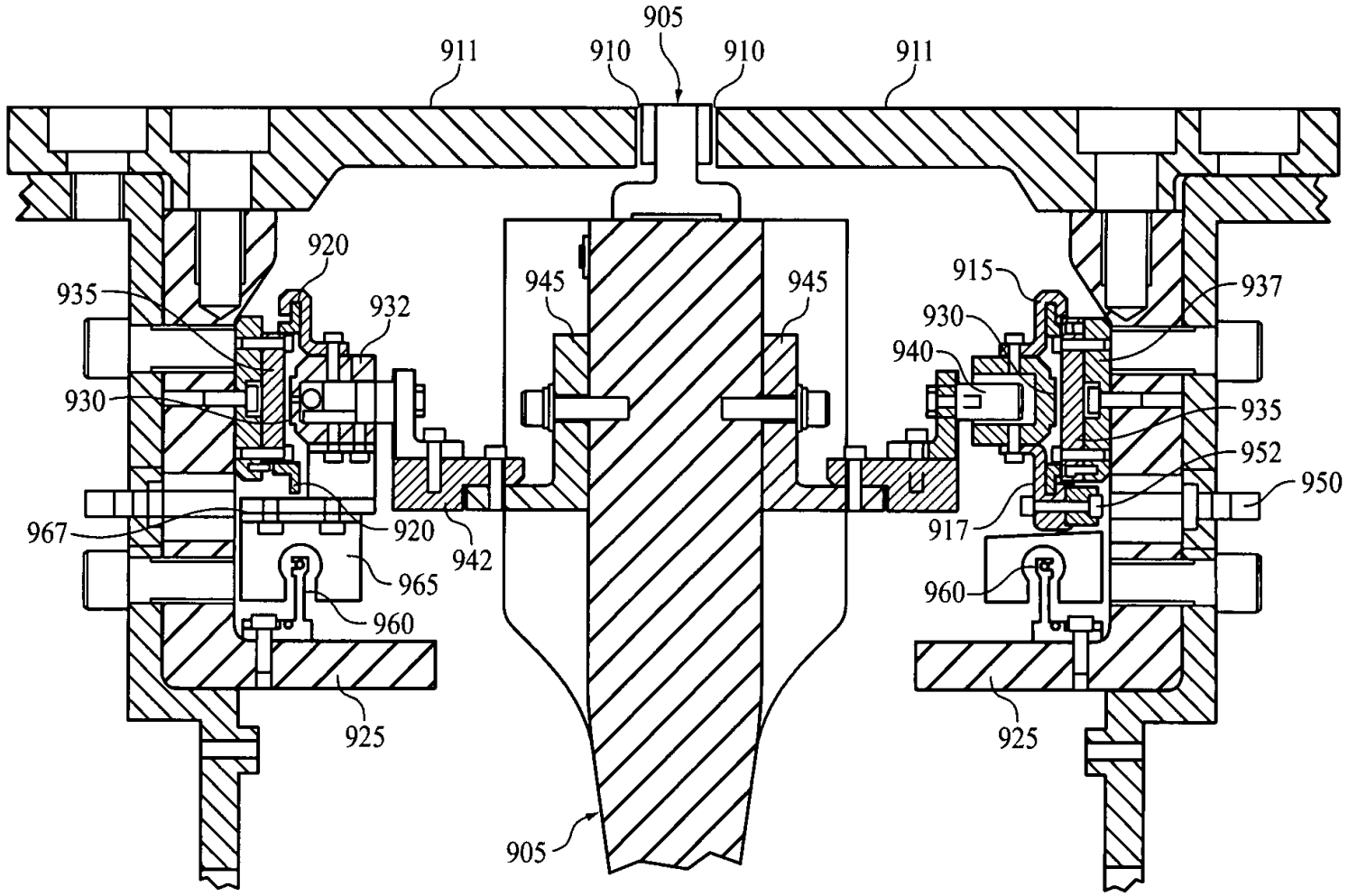
905
911
910
910
911
920
935
932
945
945
915
937
930
940
930
935
952
950
967
920
942
917
965
960
960
925
925
905

FIG. 9

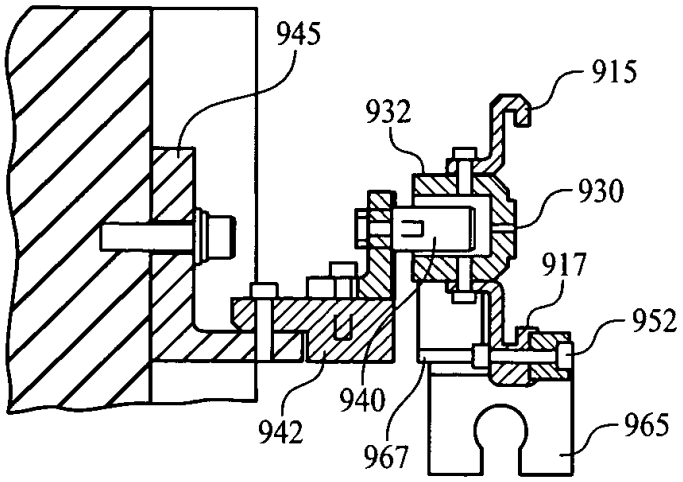
945
915
932
930
917
952
940
942
967
965

FIG. 10

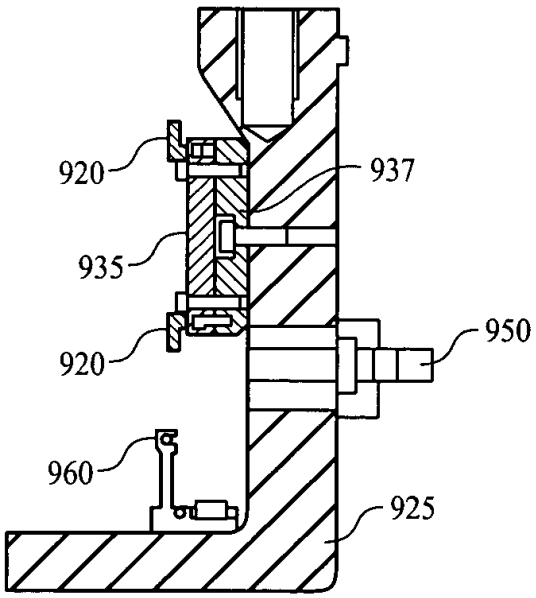
920
937
935
950
920
960
925

FIG. 11